

Applicant: Coach Wei, *et al.*
U.S.S.N.: 10/017,183
Filing Date: 12/07/2001
EMC Docket No.: EMC-06-235(PRO)ORD1

In the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the Application.

Listing of Claims:

1. (Previously presented) A method for delivering an application over a network from a backend server to a plurality of client devices, at least two of the client devices differing in type and display capabilities, the method comprising the steps of:
 - receiving a request from a client and determining a type of the client;
 - having the application invoke a Graphic User Interface (GUI) Application Programming Interface (API) to present the application's user interface;
 - in response to the type of the client, replacing the GUI API with a re-implemented, network aware GUI API comprising a User Interface (UI) record, the UI record comprising pre-determined format based messages that describe the Graphical User Interface, event processing registries, and other related information corresponding to a presentation layer of the application in high level, object level, messages;
 - sending such messages to the client device via the network;
 - processing the messages in the UI record and rendering a user interface by a client-side program operating at the client, which delivers a user experience for that device according to the display capability of the client;
 - rendering the user interface on the client device;
 - transmitting a plurality of necessary user input and a plurality of client-side events back to the server via a predetermined protocol;

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processing the user input and client-side events on the backend server, translating the events and inputs as if they were locally generated, and sending such translated events and inputs to the application for processing;

encoding and routing output of the application to the client device using the predetermined messaging format; and,

further processing the output by the client-side program to refresh the Graphical User Interface;

wherein use of the re-implemented network aware API enables the application and GUI API to be developed once and deployed multiple times for use by multiple different types of client devices.

2. (Previously presented) The method of Claim 1, wherein the GUI API and the event processing API are represented as classes within Java Foundation Classes.

3. (Previously presented) The method of Claim 1, wherein the client-side program is a computer program based on an Operating System's API.

4. (Previously presented) The method of Claim 1, wherein the client-side program is a wireless device program written using the device's Operating System's API.

5. (Previously presented) The method of Claim 1, wherein the client-side program is a program written using a Java API.

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6. (Previously presented) The method of Claim 5, wherein the JAVA API is selected from the groups consisting of : Abstract Windows Toolkit (AWT), Personal Java, Java 2 Micro Edition based GUI API or Java Swing.
7. (Previously presented) The method of Claim 1, wherein the predetermined protocol is Hyper Text Transfer Protocol HTTP.
8. (Previously presented) The method of Claim 1, wherein the predetermined protocol is Hyper Text Transfer Protocol over Secure Socket Layer (HTTPS).
9. (Previously Presented) The method of Claim 1, wherein predetermined protocol is Wireless Application Protocol (WAP).
10. (Original) The method of Claim 1, wherein predetermined protocol is proprietary.
11. (Previously presented) The method of Claim 1, wherein the predetermined messaging format is based on Extended Markup Language (XML).
12. (Previously presented) The method of Claim 1, wherein the predetermined messaging format is proprietary.

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13. (Original) The method of Claim 1, wherein the network is the Internet.
14. (Original) The method of Claim 1, wherein the network is a local area network.
15. (Original) The method of Claim 8, wherein the local area network is a bandwidth-limited slow speed network.
16. (Original) The method of Claim 1, wherein the network includes a wireless network.
17. (Previously presented) The method of Claim 11, wherein the client device is selected from the group consisting of workstations, desktops, laptops, Personal Data Assistants (PDAs), and wireless devices.
18. (Original) The method of Claim 1, wherein the server and the client device are combined into one entity.
19. (Cancelled)
20. (Cancelled)
21. (Cancelled)

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22. (Currently Amended) A system for distributing an application to a plurality of client devices having different display capabilities includes at least a server, at least a client device, and a communication means, the system comprising:

a presentation layer of the application written using a server-side API based network programming model;

a business logic layer of the application and a data layer of the application both of which are written with the server-side API and running on the server; and where

the server-side API having a supporting infrastructure that:

sends different User Interface (UI) records comprising information associated with the application's user interface information to the plurality of client devices, each UI record modifying the application's user interface according to the display capabilities of the respective client to enable display of a modified version of the application's user interface by the respective client, wherein the creation of each UI record occurs on the server-side API without user input on any client device of the plurality of client devices and further wherein the information in each UI record depends on the type of the respective client;

handles communications problems,

renders the application's user interface,

dispatches necessary user input events back to the server for processing; and wherein use of the system enables the application and application user interface to be developed once and deployed multiple times by different types of client devices.

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23. (Currently Amended) An apparatus for distributing an application over a network to a plurality of client devices, where the apparatus includes:

a server;

a network communication means;

a storage device for storing, for each client device of the plurality of client devices, a User Interface (UI) record associated with a re-implemented, network based API module that is used to transparently replace the API on which the application was developed and is customized according to display capabilities of the respective client device;

a first means for running an application of the plurality of applications where a business logic of the application runs on the server;

a second means for forwarding a given UI record to a client in response to a launch of the display the application interface on the client device in accordance with display capabilities of the client device wherein the creation of a given UI record occurs on the network based API module without user input on any client device of the plurality of client devices and further wherein the information in each UI record depends on the type of the respective client;

a third means for transferring the user interactions on the client device to the server, calculating the appropriate response to the input, and transmitting the appropriate response to the client machine;

fourth means for updating the display of the application on the client device based on the responses from the server;

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wherein use of the re-implemented network aware API enables the application and application interface to be developed once and deployed multiple times on different client devices having different display capabilities.

24. (Previously presented) The method of Claim 1 wherein the application code is not modified when distributing the application and the application code is not distributed to the client device.

25. (Previously presented) The method of Claim 1 used to distribute a plurality of pre-existing applications.